

7. Bearing again upon the question of rainfall (or the absence of drought), it has been shown, as stated, that rainfall and atmospheric pressure in India vary in a periodic manner corresponding to the ten to eleven years between a solar maximum and maximum of spots—that is, in years of maximum spots the summer rainfall is above and the winter rainfall below the average, while in the years of minimum spots the cases are reversed. From records kept at Oxford it was ascertained that a greater abundance of rain fell when the spots were most numerous and extensive.

8. The question of the causation of any effect upon the earth's temperature (one of the factors of its productiveness) has been to an extent investigated. The most trustworthy mode of inquiry, remarked Mr. E. A. Proctor, is the examination of underground temperature, and here it has been discovered, through the researches of Professor Piazzi Smyth, at Edinburgh, that a slight increase of temperature occurs at the time when spots are least numerous.

9. In close connection with this point, I may refer to the relation between the weather generally which prevails from time to time upon the earth, and the periods of sparse or copious spots. The conditions which we comprehensively term "weather" are obviously dependent upon the energy, abundant or diminished, which is communicated from the sun in the modes of light and heat; and it is reasonable to infer that great changes in the one will be associated with similar ranges of modification in the other. But observed facts must be the staple of our inductions, and facts are not yet fully decisive; it is admitted, however, on such evidence as has been procurable,

that some physical connection exists between spot-cycles and the periodical variations in weather, such as hot and cold years, wet and dry years, years of prolific and deficient harvests; but the direct relationship is so masked by other causes, which act in the production of weather, that any attempt at precise definition of the actual effect of solar maculation is not yet practicable. Mr. J. A. Broun, the well-known meteorologist, informed Professor Balfour Stewart that in his judgment all "meteorological phenomena are due to solar action; that the heating action of the sun is not the only one; but that the